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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/804,095

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Toshiharu Ito

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EXAMINER

BLEVINS, JERRY M

ART UNIT

PAPER NUMBER

2883

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Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

<b>Office Action Summary</b>	<b>Application No.</b> 10/804,095	<b>Applicant(s)</b> ITO, TOSHIHARU	
	<b>Examiner</b> Jerry Martin Blevins	<b>Art Unit</b> 2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 10 January 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 10-23, 25-27, 29, 30, 33-35 and 37-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9, 24, 28, 31, 32 and 36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>03/19/2004</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of Species I, corresponding to claims 1-9, 24, 28, 31(3,4), 32, and 36, in the reply filed on January 10, 2006 is acknowledged.

Claims 10-23, 25-27, 29, 30, 31(10-13,14-17), 33-35, and 37-39 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on January 10, 2006.

### ***Claim Objections***

Claim 31 is objected to because of the following informalities:

Claim 31 depends from any one of claims 10-13 as well as any one of claims 14-17, all of which have been withdrawn from consideration. Examiner will only consider the claim 31 as it depends from elected claims 3 and 4.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 5, no structure for the optical amplifier is indicated in the claims. Therefore, it is unclear to the examiner what structure limitations are required for the bypass circuit. For purposes of examination, examiner interprets that the actual structure of the optical amplifier and bypass circuit is irrelevant as long as the optical amplifier and bypass circuit have the same structure.

Regarding claim 6, it is unclear to the examiner whether the claim language requires three separate 4-port circulators (one each corresponding to the first and the second optical connectors and to the bypass circuit) or a single 4-port circulator that singly serves as each of the first and the second optical connectors and the bypass circuit. For purposes of examination, examiner interprets the claim to refer to the latter.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 7, 8, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent to Shigematsu et al., number 5,214,728.

Regarding claim 1, Shigematsu teaches a module for amplifying a signal light with a remote excitation-light (Figure 3a), comprising: a first optical input/output line (5) through which a signal light is transmitted; a second optical input/output line (11) through which a signal light is transmitted; an optical amplifier (7) which amplifies a signal light on receipt of an excitation light transmitted through said first or second optical input/output line; a bypass circuit (8) which allows said signal light to bypass said optical amplifier; a first optical connector (21) which optically connects said first optical input/output line to said optical amplifier, and further optically connects said first optical input/output line to said bypass circuit; and a second optical connector (22) which optically connects said second optical input/output line to said optical amplifier, and further optically connects said second optical input/output line to said bypass circuit.

Regarding claim 2, Shigematsu teaches that the first optical connector is comprised of a first optical 3-port circulator having first, second and third ports wherein a signal light input through said second port is output through said third port, a signal light input through said first port is output through said second port, and a signal

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light input through said third port is not output through any ports (Figure 3b and column 7, line 66 – column 8, line 23, wherein port Z corresponds to applicant's port 1, port X corresponds to applicant's port 2, and port Y corresponds to applicant's port 3), said second optical connector is comprised of a second optical 3-port circulator having first, second and third ports wherein a signal light input through said second port is output through said third port, a signal light input through said first port is output through said second port, and a signal light input through said third port is not output through any ports (Figure 3b and column 7, line 66 – column 8, line 23, wherein port Z corresponds to applicant's port 1, port X corresponds to applicant's port 2, and port Y corresponds to applicant's port 3), said first optical 3-port circulator is optically connected at its second port to said first optical input/output line, at its third port to said optical amplifier, and at its first port to said bypass circuit (Figure 3A), and said second optical 3-port circulator is optically connected at its second port to said second optical input/output line, at its third port to said bypass circuit, and at its first port to said optical amplifier (Figure 3A).

Regarding claims 3 and 4, Shigematsu teaches that the first optical connector is comprised of a first optical filter having first, second and third ports wherein said second port is a port through which a signal light comprised of a signal light having a first wavelength band and a signal light having a second wavelength band, combined to each other, is input and output, said third port is a port through which a signal light having said first wavelength band is input and output, and said first port is a port through which a signal light having said second wavelength band is input and output, said

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second optical connector is comprised of a second optical filter having first, second and third ports wherein said second port is a port through which a signal light comprised of a signal light having a first wavelength band and a signal light having a second wavelength band, combined to each other, is input and output, said third port is a port through which a signal light having said first wavelength band is input and output, and said first port is a port through which a signal light having said second wavelength band is input and output (Figures 3a and 3b show that ports X, corresponding to ports 2 of present application, of connectors 21 and 22, are connected to I/O lines 5 and 11, respectively, which transmit the combined signals, whereas ports Y and Z, corresponding to ports 3 and 1, respectively, are connected to the optical amplifier and the bypass circuit, respectively, where the signal is wavelength split along the two channels), said first optical filter is optically connected at its second port to said first optical input/output line, at its third port (or first port, since the designation of first and second wavelengths is arbitrary and thus interchangeable) to said optical amplifier, and at its first port (or third port) to said bypass circuit, and said second optical filter is optically connected at its second port to said second optical input/output line, at its third port (or first port) to said optical amplifier, and at its first port (or third port) to said bypass circuit (Figure 3a).

Regarding claim 5, Shigematsu teaches that the bypass circuit and the optical amplifier are both optical fibers (column 7, line 50 – column 8, line 8).

Regarding claim 7, Shigematsu teaches that the optical amplifier includes optically amplifying medium comprised of an optical fiber into which rare earth element is doped (column 7, lines 50-58).

Regarding claim 8, Shigematsu teaches that the excitation light to be transmitted to the amplifier is one of forward excitation light and a backward excitation light (Figure 3a and column 4, line 56 – column 8, line 23).

Regarding claim 24, Shigematsu teaches an optical-fiber communication system (Figure 3a) allowing first and second sites (20, 30) to make optical communication therebetween, comprising: at least one module (7) for amplifying a signal light with a remote excitation-light; a first optical fiber (connected to connector 4) optically connecting said module to said first site; and a second optical fiber (connected to connector 12) optically connecting said module to said second site, said module comprising: a first optical input/output line (5) through which a signal light is transmitted; a second optical input/output line (11) through which a signal light is transmitted; an optical amplifier (7) which amplifies a signal light on receipt of an excitation light transmitted through said first or second optical input/output line; a bypass circuit (8) which allows said signal light to bypass said optical amplifier; a first optical 3-port circulator (21) having first, second and third ports wherein a signal light input through said second port is output through said third port, a signal light input through said first port is output through said second port, and a signal light input through said third port is not output through any ports; and a second optical circulator (22) having first, second and third ports wherein a signal light input through said second port is output through



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said third port, a signal light input through said first port is output through said second port, and a signal light input through said third port is not output through any ports, wherein said first optical 3-port circulator is optically connected at its second port to said first optical input/output line, at its third port to said optical amplifier, and at its first port to said bypass circuit, said second optical 3-port circulator is optically connected at its second port to said second optical input/output line, at its third port to said bypass circuit, and at its first port to said optical amplifier (Figure 3a), said first optical input/output line is optically connected to said first optical fiber, and said second optical input/output line is optically connected to said second optical fiber (Figure 3a).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 28 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shigematsu.

Regarding claim 28, Shigematsu teaches an optical-fiber communication system (Figure 3a) allowing first and second sites (20, 30) to make optical communication therebetween, comprising: a first module (7) for amplifying a signal light with a remote excitation-light; said first module comprising: a first optical input/output line (5) through which a signal light is transmitted; a second optical input/output line (11) through which a signal light is transmitted; an optical amplifier (7) which amplifies a signal light on receipt of an excitation light transmitted through said first or second optical input/output line; a bypass circuit (8) which allows said signal light to bypass said optical amplifier; a first optical 3-port circulator (21) having first, second and third ports wherein a signal light input through said second port is output through said third port, a signal light input through said first port is output through said second port, and a signal light input through said third port is not output through any ports; and a second optical circulator (22) having first, second and third ports wherein a signal light input through said second port is output through said third port, a signal light input through said first port is output through said second port, and a signal light input through said third port is not output

through any ports, wherein said first optical 3-port circulator is optically connected at its second port to said first optical input/output line, at its third port to said optical amplifier, and at its first port to said bypass circuit, said second optical 3-port circulator is optically connected at its second port to said second optical input/output line, at its third port to said bypass circuit, and at its first port to said optical amplifier (Figure 3a), said first optical input/output line is optically connected to said first optical fiber, and said second optical input/output line is optically connected to said second optical fiber (Figure 3a), wherein an optical input/output line of the first module is optically connected to the first site through an optical fiber (Figure 3a, where the fiber is connected at connector 4).

Shigematsu does not teach a second optical module for amplifying a signal light with a remote excitation-light having the same structure as that of the first module, wherein an input/output line of the first module is optically connected to a corresponding optical input/output line of the second module through an optical fiber, and an second optical input/output line of the second module is optically connected to the second site through another optical fiber. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Shigematsu with the second identical module and the necessary corresponding connections, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St Regis Paper Co. v. Bemis Co.*, 193 USPQ 8. The motivation would have been to increase bi-directional amplification capabilities.

Regarding claim 31, Shigematsu teaches the limitations of the base claims 3 and 4. However, Shigematsu does not teach two separate modules. It would have been

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obvious to one of ordinary skill in the art at the time of the invention to modify Shigematsu with the second module and the necessary corresponding connections, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St Regis Paper Co. v. Bemis Co.*, 193 USPQ 8. The motivation would have been to increase bi-directional amplification capabilities.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shigematsu in view of US Patent to Saeki, number 6,377,393.

Regarding claim 6, Shigematsu teaches the limitations of the base claim 1. Shigematsu does not teach an optical 4-port circulator. Saeki teaches an optical 4 port circulator (Figure 2, element 3) having first (33), second (34), third (31) and fourth (32) ports wherein a signal line input through the third port is output through the fourth port, a signal line input through the first port is output through the second port, a signal line input through the second port is output through the third port, and a signal line input through the fourth port is not output through any ports (Figure 1), and the optical 4-port circulator is optically connected at its third port to a first input/output line (11), at its fourth port to an optical amplifier (2) at one end thereof, at its first port to the optical amplifier at the other end thereof, and at its second port to a second optical input/output line (12). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Shigematsu with the optical 4-port circulator of Saeki. The motivation would have been to simplify the structure, since a single 4-port circulator takes the place of 2 circulators and a bypass circuit.

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Claims 9, 32, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shigematsu in view of US Pre Grant Publication to Kosaka et al., number 2004/0086246.

Regarding claims 9, 32, and 36, Shigematsu teaches (or renders obvious) the limitations of the base claims 1, 24, and 28, respectively. Shigematsu also teaches at least one optical isolator (71,72) arranged between the optical amplifier (73) and at least one of the first (21) and second (22) optical connectors. Shigematsu does not teach at least one device for compensating for optical dispersion. Kosaka teaches a device for compensating for optical dispersion (Figure 5, element 7), as well as an optical isolator (6), both arranged between an optical amplifier (1C) and an optical connector (3a), wherein the dispersion compensation in said device is equal to smaller one of first and second factors wherein said first factor is defined as wavelength dispersion stored in a signal light in said first and second optical fibers, with an error of about 10%, and said second factor is defined as compensation provided by a dispersion-compensation device having optical loss equal to or smaller than a gain of said module (pages 4-7, paragraphs 73-117). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Shigematsu with the dispersion compensator of Kosaka. The motivation would have been to improve transmission efficiency.

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**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry Martin Blevins whose telephone number is 571-272-8581. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JMB



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